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(54) Title: A METHOD OF MAKING FIBREBOARDS BY THE DRY METHOD TECHNIQUE (57) Abstract A method of making fibreboards by the dry method technique where a lignocellulose-containing fibre material is disintegrated into fibres which are dried and formed into a fibre mat which is hot-pressed. Binding between the fibres is obtained by means of a binder which can be added before or after drying. According to the invention the binder is added before drying and the fibres with the binder are dried to have a moisture content substantially lower than that moisture content in the material which is suitable for hot-pressing. After drying, moisture is added to the fibre material in a degree such as to attain the moisture content suitable for hot-pressing, whereby the tackiness of the binder, which has got lost to a great extent during drying, is restored.		

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A METHOD OF MAKING FIBREBOARDS BY THE DRY
METHOD TECHNIQUE

The present invention relates to a method of making fibreboards by the dry method technique, in which a lignocellulose-containing fibre material is disintegrated into fibres. The fibres are dried and formed into a fibre mat which is hot-pressed, the binding between the fibres being obtained by means of a binder.

The lignocellulose-containing fibre material is prepared, for instance, by chipping of wood into chips which are defibrated in a per se known manner in a grinding apparatus, e.g. a defibrator, into fibres of desired fineness. After a binder has been added to the fibres and these have been dried the continued treatment consists in forming the fibres in a forming apparatus into a porous fibre mat of uniform thickness, e.g. in the order of 300-500 mm. To reduce the height of the hydraulic hot press in which the fibre mat is to be consolidated into a considerably thinner board the fibre mat is allowed after the forming operation to pass a so-called pre-press where the fibre mat is compressed into a thickness in the same region as the ready-pressed fibreboard. When the fibreboard leaves the pre-press it rebounds to a certain extent, and it has been found that the rebound will be considerably less if the added binder has retained most of its tackiness.

The binder is often added to the fibre when this is blown by means of steam from the grinding apparatus to the drier where the fibre is dried to have a moisture content of 12-15%. The binder will thus have approximately the same low moisture content as the fibre material, which means that the binder loses most of its tackiness so that the rebound of the fibre mat increases, as described above. In this connection one might imagine adding moisture afterwards, which in and per se might involve a certain increase of the tackiness of the fibres



and consequently a reduction of the rebound. However, such adding would increase the total moisture content of the fibre mat so that this would be unsuitably high for the subsequent hot pressing.

5 To solve this problem it is known instead to blow the fibre from the grinding apparatus to the drier without any addition of binder and to dry the fibre to a considerably lower moisture content, normally 4-6%. The dried fibre is then admixed with binder in a specific
10 apparatus, a so-called glue mixer, in which the binder is added at a concentration of about 50-55%. Part of the water in the binder solution will be sucked into the fibres but probably the moisture content in the binder is still in the range of 30-40%, which means that the
15 binder largely retains its tackiness. This way of adding binder will thus have the advantage in subsequent operations that the rebound of the fibre mat decreases. On the other hand, this glueing technique has a great disadvantage, viz. in that fibreboards made in this way will
20 have a stained surface, which involves a deterioration in quality.

The main purpose of this invention is thus to obtain a solution of the problem described above and a main object of the invention is to restore the tackiness
25 of the binder so as to obtain the same low rebound after pre-pressing as when the binder has been added after drying, by a suitable treatment of fibres to which binder has been added prior to drying so that the binder has lost its tackiness.

30 These objects are achieved by this invention in that the binder is added, as mentioned in a per se known manner, to the fibres prior to drying, but drying is carried out to attain a moisture content which is lower than the moisture content suitable for hot-pressing, and in that
35 moisture then is added to the fibres to such a degree that a moisture content suitable for hot-pressing is attained again. Further characteristic features of the invention will appear from the sub-claims.



It has surprisingly been found that several advantages result from the method of the invention in which the fibres thus are dried by means of the added binder to a considerably lower moisture content than that which is suitable for hot-pressing and which usually is in the range of 10-15%, preferably 11%, and the fibres thereupon are moistened to have said moisture content. As the binder is situated on the outside of the fibres the binder will be given a moisture that is sufficient to restore its tackiness to essentially full extent in spite of the fact that the total moisture content of the material, i.e. the fibres plus the binder, lies within the range suitable for hot-pressing. The moistening of the binder has still another positive effect. As the moisture content of the binder increases it will be easier for it to flow out between the fibres during the hot-pressing operation and the fibreboards will thereby be given a higher strength. Another way of expressing the same thing is to say that a certain strength of the fibreboards can be obtained with a smaller amount of binder if the moisture content of the binder is increased prior to hot-pressing. As the cost for binders is one of the greatest items of expenditure in making this type of fibreboards a reduction of the binder addition can thus involve important saving in the variable costs.

The binder usually consists of a urea resin or a melamine-reinforced urea resin, especially when making fibreboards of medium hardness. To increase the effect of the moisture added as described above and to effect a further improvement of the tackiness of the fibre the added moisture may consist of a diluted solution or emulsion containing a small amount of thermoplastic or thermosetting resins, e.g. polyvinyl compounds or urea glue. This technique is also suitable for adding simultaneously all or part of the hardener substance that would normally be mingled into the binder, e.g. of the



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type described above, which is added to the fibre prior to drying. The risk that an initial hardening of the binder would occur during the drying operation will thus also be eliminated to a great extent by this invention.

5 The invention is of course not restricted to that described above but may be modified within the scope of appended claims.



CLAIMS

1. A method of making fibreboards by the dry method technique, in which a lignocellulose-containing fibre material is disintegrated into fibres and the fibres are dried and formed into a fibre mat which thereupon
5 is hot-pressed, the binding between the fibres being obtained by means of a binder, c h a r a c t e r i z e d by adding the binder in a per se known manner to the fibres prior to drying and carrying out the drying operation to have a moisture content lower than a pre-de-
10 termined moisture content suitable for hot-pressing, and thereupon adding moisture to the fibres in a degree such as to attain said moisture content suitable for hot-pressing.

2. A method as claimed in claim 1, c h a r a c -
15 t e r i z e d by adding the moisture substantially in the form of water.

3. A method as claimed in claim 1, c h a r a c -
t e r i z e d by adding the moisture in the form of a diluted solution or emulsion including thermoplastic
20 or thermosetting resins, e.g. polyvinyl compounds or urea glue.

4. A method as claimed in any of claims 1 - 3, in which a binder containing hardener substances is used, c h a r a c t e r i z e d by adding all or part of
25 the hardener substance in connection with moistening.

5. A method as claimed in any of claims 1 - 4, c h a r a c t e r i z e d by carrying out drying to a moisture content which is substantially below 10-15%.



INTERNATIONAL SEARCH REPORT

International Application No PCT/SE83/00231

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ¹		
According to International Patent Classification (IPC) or to both National Classification and IPC ³		
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II. FIELDS SEARCHED		
Minimum Documentation Searched ⁴		
Classification System	Classification Symbols	
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US C1	264:109	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁵		
SE, NO, DK, FI classes as above		
III. DOCUMENTS CONSIDERED TO BE RELEVANT ¹⁴		
Category ⁶	Citation of Document, ¹⁴ with indication, where appropriate, of the relevant passages ¹⁷	Relevant to Claim No. ¹⁸
X	GB, A, 2 025 989 (REICHHOLD LIMITED) 30 January 1980 & FR, 2 431 365 DE, 2 929 243 AU, 49081/79 JP, 55 015 897 CA, 1 135 610 SE, 7 906 191	1-5
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Date of the Actual Completion of the International Search ¹	Date of Mailing of this International Search Report ¹	
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Swedish Patent Office	Olov Jensen	